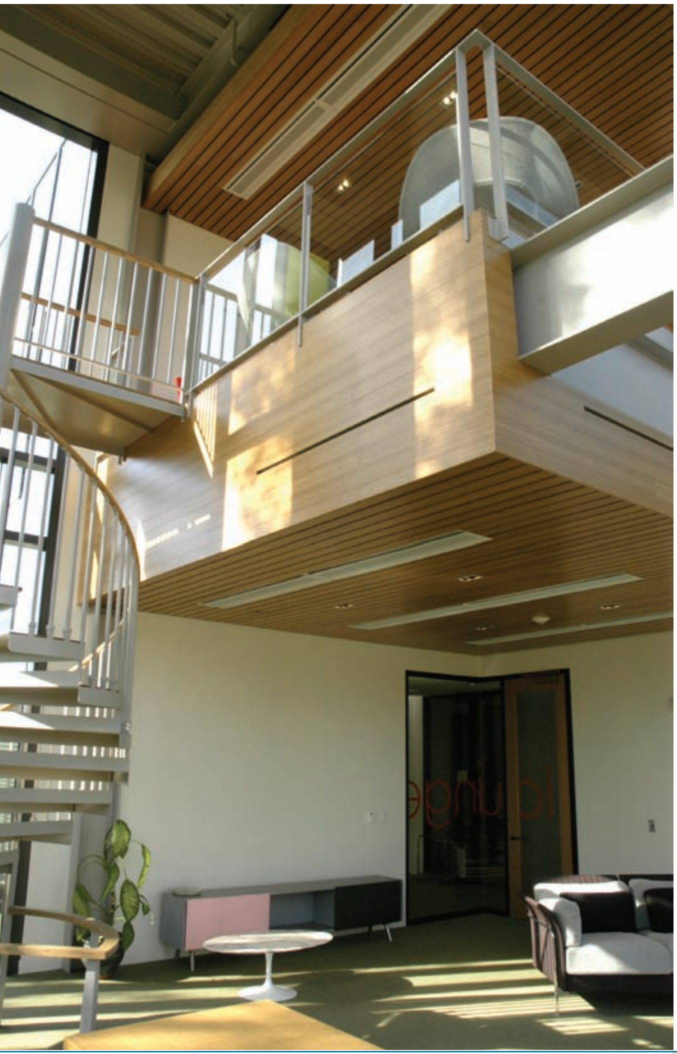
ANNENBERG CENTER DEDICATED



On October 30, 2009, Caltech's newest building officially opened its doors. The Walter and Leonore Annenberg Center for Information Science and Technology (IST) will house members of the IST initiative, now scattered across campus. As Engineering and Applied Science Division Chair Ares Rosakis remarked at the dedication, "Many universities have created schools of information science. These programs generally focus on hardware and software. IST, in contrast, is based on the concept of information as a unifying principle. We have gathered people from computer science, physics, biology and bioengineering, economics, applied mathematics, computation and neural systems, applied physics, control and dynamical systems, and electrical engineering to think together about the fundamental theoretical underpinnings of information as well as its practical applications, such as computing with DNA, creating tunable biological circuits, understanding complex social systems, and designing a 'smart' electric grid."

"IST is about connecting different areas of scientific and engineering inquiry," says Peter Schröder, professor of computer science and applied and computational mathematics, and chair of the building committee. "We wanted to create a structure where you have a lot of transparency. People see each other; people get inspired by noticing something. You don't want people to just disappear behind closed doors." As a result, windows proliferate inside as well as outside. This ubiquity of glass allows sunlight to shine in from a spacious, two-story central atrium, flooding every office with the light that's often rare in other structures—no grad students toiling in dungeon-like basements here. Fresh air also flows into the building through operable windows in nearly every office.

Natural light and air make Annenberg a comfortable place for contemplation—one of the guiding principles behind the center's architecture, says Schröder. "A building is not going to generate an idea. It's the people in the building that generate the ideas. But if the people are happy and they have pleasant encounters with their fellow occupants, then that's going to support cross-fertilization between disciplines."

Office doors are slightly recessed, leading to jagged hallways that avoid the institutional, sterile feel of

Above left: Windows on three sides let sunlight play over the lounge that projects from the northeast corner of the new Annenberg Center for Information Science and Technology. The indoor picnic table in front of the spiral staircase is a popular lunch spot.
Opposite: The lounge's second floor has a whiteboard within arm's reach of the comfy chairs. There's also a rocking chair to stimulate deep thoughts—or a brain-refreshing doze.

The Annenberg Center fronts on the Moore Walk, opposite Avery House.

seemingly infinite corridors. Along the hallways and in corners, chairs and small tables beside whiteboards stocked with markers encourage impromptu discussions and, one hopes, fresh ideas. "These sorts of things are architectural theory until you see them actually used," Schröder says, but one day he did see some grad students arguing over equations on the board. "That was one of those little moments where I felt pretty good about what we had done, that we had at least accomplished some of these lofty goals." Tables and chairs scattered on the terrace on the north side of the building invite people to sit and linger, and there's even an outdoor blackboard at the building's southwest corner for scientific debates.

Well-designed spaces don't cost much more, Schröder says, and it's worth it to improve the general well-being of the building's inhabitants. For example, the designers chose furniture to be warm and relaxing, which goes a long way toward making people comfortable. Even the wall clocks, with their colors and astral shapes, are from a classic design by George Nelson, a founder of the American Modernism school. And the rich wood paneling found throughout the building is not only pleasing to the eye, but is actually bamboo—a sustainable material.

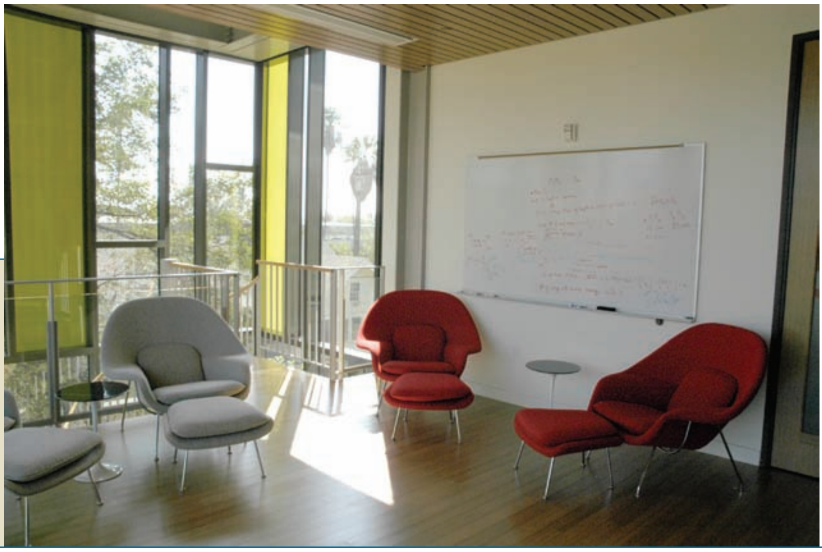
The building, designed by Frederick Fisher and Partners, is among several Caltech construction projects on track for gold certification under the Leadership in Energy and Environmental Design (LEED) rating system. The center's building materials have at least 20 percent local—minimizing transportation and labor costs—or recycled content. The building also uses 25 percent less energy and 30 percent less water than California state law requires. The designers also minimized the use of harmful chemicals called volatile organic compounds, a feature chiefly noticeable by the lack of those new-paint and new-carpet smells.

Annenberg's operable windows are another design triumph. Central heating and cooling systems don't work well with open windows, but fresh air was seen as so important that independent climate controls were built into each room. This would have been significantly more expensive, were it not for an energy-efficient heating and cooling system that circulates hot and chilled water above the ceiling panels to adjust the temperature. This system is new to Caltech, although common in Europe, Schröder says. And because it doesn't require big aluminum air ducts snaking overhead, the spaces between stories are smaller, which saves even more money—both in construction and operating costs.

Aesthetically, the building echoes the architectural rhythms of the campus, notes Schröder. The outdoor stairways reflect the styles of Spanish architecture (as an added bonus, they save more money by not needing walls and a roof around them), as do the repeating window patterns. The green exterior mimics the hues of olive leaves on the trees that dot the campus.

The center houses 16 research units. There are no wet labs; instead, each unit has a common room called a "studio." But there's a lab full of workstations for undergrads to use on class projects, and a machine room packed with high-powered cluster computers that serve the entire campus.

The building's culture is decidedly egalitarian: all the offices are roughly the same size (although grad students and postdocs still have to share space with each other), and the best areas are shared by all: the northeast lounge, for example, boasts sweeping views of the San Gabriel Mountains. "The idea was that the best, most beautiful piece of real estate should be made public," Schröder says.



Left: Floor-to-ceiling windows opening into the atrium let light into the research groups' studios. The "trellis" of jigsawed bamboo was generated by a random-line algorithm as a representation of a densely connected network. Below: Hidden therein is a Caltech beaver.

Good design is more than just good looks, Schröder argues. It makes a "difference in the quality of our lives, in the mood of our spirits, and in the loftiness of our creative flights." How high these creative flights go remains to be seen. "We'll have to give it a year or two before we can truly evaluate how various things are working out," he says. "But so far, so good."

Built by Hathaway Dinwiddie, the $31 million building was made possible by the Annenberg Foundation and by Stephen Bechtel Jr. The Moore Foundation provided the seed funding for the IST initiative. —*MW* e&s

The Annenberg Center dedication video is available online, as is an interview with Jehoshua "Shuki" Bruck, founding director of the IST program and the 2008 winner of Caltech's Feynman Prize for Excellence in Teaching. You can also view a slideshow of interior and exterior pictures of the Annenberg Center.

UBIQUITIN'S KISS OF DEATH

Ubiquitin is a molecular stoolie, fingering other proteins for destruction by a cell's molecular trigger men. But don't feel bad for the victims—they all need to die. Some are molecules whose job is done, such as messengers whose signal has been sent. Others might be old and falling apart, or perhaps didn't form properly in the first place. Ubiquitin fingers its marks for the whisper chipper by attaching a chain of four or more copies of itself to the soon-to-be-departed, but like any good hit, it all happens so fast that you can't see it coming.

Until now, that is. Nathan Pierce, a grad student in the lab of Raymond Deshaies, a professor of biology at Caltech and a Howard Hughes Medical Institute investigator, has created a sort of biological stop-motion animation based on a piece of apparatus called a quench-flow machine that allows you to stop, or quench, a reaction after a very precise interval of time has elapsed—for these studies, in increments of 10 milliseconds. Previous studies had looked at the reaction on the scale of seconds or minutes, which "did not have sufficient time resolution to see what was going on," says Deshaies. "It's as if you gave an ice-cream cone to a child and took a picture every minute. You would see the ice cream disappear from the first photo to the next, but since the pictures are too far apart in time, you would have no idea whether the kid ate the ice cream one bite at a time, or swallowed the entire scoop in one gulp."

In this case, the question was whether the ubiquitin molecules got added one at a time, or did the entire preassembled chain get added in one go? It was already known that three different enzymes, dubbed E1, E2, and E3, are involved in the process. E1 readies the ubiquitin for transfer, then hands it off to E2. A form of E3 called a RING ligase (RING stands for "really interesting new gene") then binds to the E2 and the target protein simultaneously, causing the E2 to transfer the ubiquitin molecule to the target. "The process is so complicated and so fast," Pierce notes, "that we weren't able to see how the chain is actually built."

It turns out that the ubiquitins are attached one by one, and a paper by Pierce announcing this appeared in the December 3, 2009, issue of *Nature*. In addition to Pierce and Deshaies, the other authors were postdoc Gary Kleiger and Assistant Professor of Chemistry Shu-ou Shan.

The next task was to figure out how the process works so quickly. One answer was provided in a parallel study spearheaded by Kleiger. He showed that E2 and E3 interact with each other at a blistering pace while building the chain—far faster than is commonly seen in protein trysts. As is often the case with humans, opposites attract, and the enzymatic speed dating is enabled by an acidic tail on E2 that nestles into an alkaline canyon on E3. Kleiger's work appeared in the November 25, 2009, issue of *Cell*; the other authors included Caltech postdoc Anjanabha Saha, Steven Lewis and Brian Kuhlman of the

University of North Carolina at Chapel Hill, and Deshaies.

Deshaies now wants to find the reaction sequence's slowest step, the one that sets the speed limit for the entire process. By finding the slowest step and making it slower, he says, the enzymes "may become too slow to get their job done—to build chains—in the time available to them to do so. Being able to develop drugs to block their function would open up a new frontier in medicine."

The work was funded by a Gordon Ross Fellowship, the National Institutes of Health, and the Howard Hughes Medical Institute. *—LO* e&s

DIM AND DIMMER

Out in the deep, dark reaches of the solar system beyond Neptune's orbit lies the Kuiper Belt, a vast ring of icy bodies big and small—including the Pluto formerly known as planet. Now, a Caltech-based team has used the Hubble Space Telescope to spot the smallest object ever seen out there—a chunk of debris only one kilometer in diameter. Over 1,000 Kuiper Belt objects have been discovered to date, but the next smallest one is roughly 30 kilometers across.

This piece of coal-black rubble from the birth of the solar system is some 6.7 billion kilometers away—half again as distant as Neptune—and 100 times dimmer than anything that the Hubble can see directly. Instead, the team used data from Hubble's fine guidance sensors, which lock onto various guide stars in order to keep the telescope trained on whatever the astronomers happen to be studying. The sensors collect the guide stars' light 40 times per second in order to measure the slightest changes in their positions, enabling the Hubble to stay rock-steady in its gaze.

Grad student Hilke Schlichting (MS '07, PhD '09) sifted through four and a half years of this tracking data, looking for any momentary dimmings of guide stars caused by Kuiper Belt denizens passing between them and us. Specifically, she was searching for a telltale diffraction pattern caused when an interloper intrudes on our line of sight—a new twist on the old high-school optics experiment using a slit and a light bulb, with the Kuiper Belt object acting as the slit.

NOW YOU SEE WHAT WISE SEES

A star, a star, burning in the night; it's the picture of WISE's first light. It's the picture from WISE's first light.

The Wide-field Infrared Survey Explorer, launched on December 14, 2009, has doffed its lens cap and snapped its first image—of a dim red star called V482 Carina that would be just barely visible to the naked eye. In the background are some 3,000 other stars in a field of view about three times the area of the full moon.

For the next nine months, WISE will be taking a picture once every 11 seconds, mapping the entire infrared sky one and a half times and revealing everything from dark asteroids nearby to dusty galaxies 10 billion light-years away. The science team includes Assistant Professor of Astronomy Andrew Blain, Members of the Professional Staff Roc Cutri, Thomas Jarrett, J. Davy Kirkpatrick, and Deborah Padgett (PhD '92), plus Peter Eisenhardt, T. Nick Gautier, Amy Mainzer (MS '01), and Michael Ressler of JPL. Caltech's Infrared Processing and Analysis Center is compiling the data.

JPL is managing the mission; the spacecraft was built by Ball Aerospace, and the instrument by Utah State University. *—DS* e&s

The data, from 12,000 hours of telescope time, yielded exactly one occultation in the swath of sky extending 20 degrees from the solar system's ecliptic plane, where the Kuiper Belt is expected to be densest. Based on downward extrapolations from the known population, the team had expected to turn up more than 20 bodies in the 300-meter size range. The whopping deficit supports the notion that these comet-sized objects are continuously colliding and grinding one another down, which would mean that the Kuiper Belt's dwellers are evolving—they aren't simply static souvenirs of our solar system's formation, safely stored in the deep freeze.

Furthermore, says the *Nature* paper describing the find, this pulverization process "provides the missing link between large Kuiper Belt objects and dust, producing [the] debris disks [observed] around other stars."

Schlichting's paper was published on December 17, 2009. The other authors are Caltech postdoc Eran Ofek; Mike Wenz of the Goddard Space Flight Center; Associate Professor of Astrophysics and Planetary Science Re'em Sari; Avishay Gal-Yam, a senior scientist at the Weizmann Institute of Science and a visiting associate in astronomy at Caltech; Mario Livio of the Space Telescope Science Institute; Ed Nelan of the Space Telescope Science Institute; and Shay Zucker of Tel Aviv University. —*DS* e&s

PARALLAX IN MOTION

Four hundred years after Galileo first turned a homemade spyglass to the heavens, the somewhat larger Hale Telescope at Caltech's Palomar Observatory has discovered a new star, Alcor B, in the Big Dipper—using a technique he foresaw. Says team leader Ben Oppenheimer (PhD '99), of the American Museum of Natural History in Manhattan, "Galileo realized that if Copernicus was right—if the earth orbits the sun—he could show it by observing the parallactic motion of the nearest stars. He tried to use Alcor to see this, but didn't have the necessary precision." Parallactic motion is the way that nearby stars appear to move slightly, relative to the firmament, over the course of a year as we see them from different points in Earth's orbit.

Alcor B is a red dwarf about 250 times the mass of Jupiter, or one-quarter that of our sun. The star around which it orbits, Alcor A, is a relatively young star twice the mass of the sun. The Alcors share their position—second star from the end in the Dipper's handle—with another star, Mizar. (In fact, the ability to see both stars—being able to distinguish "the rider from the horse"—was a common test of eyesight among ancient peoples.) One of Galileo's colleagues observed that Mizar itself is actually a double, making it the first binary star system resolved by a telescope. Many years later, Mizar A and B were each found to be tightly orbiting binaries, altogether forming a quadruple system.

Last March, members of Project 1640, a collaborative hunt for planets orbiting other stars, attached their coronagraph—a device for blocking out a star's light, allowing faint objects nearby to be seen—to the Hale and aimed it at Alcor. "Right away I spotted a faint point of light next to the star," says Neil Zimmerman, a grad student at Columbia who is doing his dissertation at the museum.

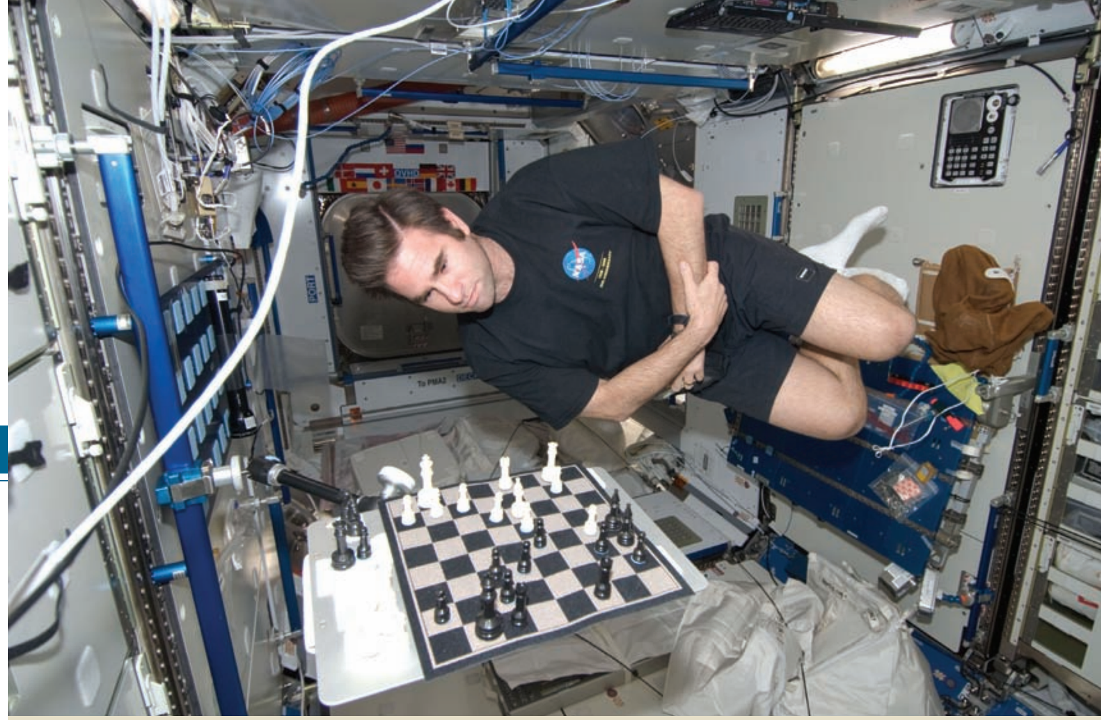
The team returned 103 days later, hoping to find that the two stars had moved as one. If the proposed companion was just a background star, it wouldn't necessarily be keeping Alcor company any more. But the two had, indeed, moved in tandem, says Oppenheimer. "Our technique is much faster than the usual way of confirming that objects in the sky are physically related." If the putative pair is too far away for parallax, you may have to watch them for years in order to measure any motion.

The Alcors are about 80 light-years away, and over one year they appear to move in an ellipse about 0.08 arc seconds long. This is about 1,000 times smaller than the eye can discern—but easily detectable with the coronagraph's adaptive optics, which remove the distorting effects of atmospheric turbulence and thus allow very fine position measurements to be made.

"We hope to use this technique to check that any potential exoplanets we find are truly bound to their host stars," says Zimmerman.

"Red dwarfs are not commonly reported around the brighter, higher-mass type of star that Alcor is, but we have a hunch that they are actually fairly common," says Oppenheimer. "This discovery shows that even the brightest and most familiar stars hold secrets we have yet to reveal."

The Project 1640 collaboration includes researchers from the American Museum of Natural History, the University of Cambridge, and the Space Telescope Science Institute, as well as Associate Professor of Astronomy Lynne Hillenbrand, Senior Faculty Associate in Astronomy Charles Beichman, postdocs Sasha Hinkley and Justin Crepp, adaptive optics engineer Antonin Bouchez (PhD '04), and Member of the Professional Staff Richard Dekany (BS '89) from Caltech, and Gautam Vasisht (PhD '96), Rick Burruss, Michael Shao, Lewis Roberts, and Jennifer Roberts of JPL. Project 1640 is funded by the National Science Foundation.
—*SK* e&s



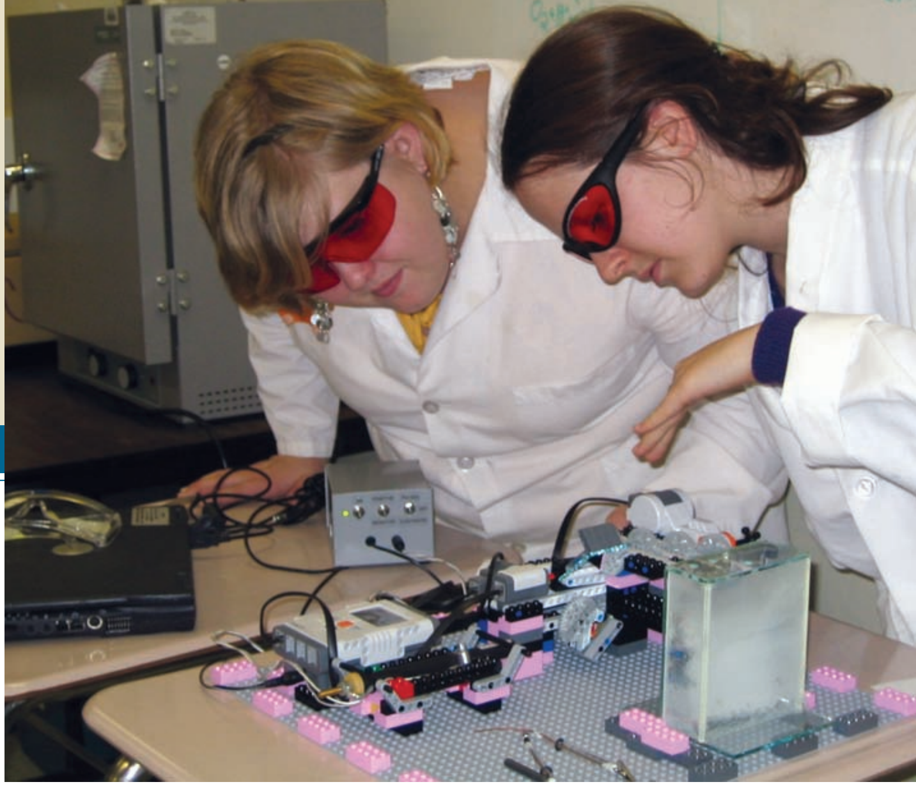
Gregory Chamitoff (MS '85) ponders his next move in the galaxy's first "Earth vs. Space" chess match while aboard the International Space Station. (Earth won.) Chamitoff, who spent 183 days on the station in 2008, also took time out while in orbit to participate, via video downlink, in the 80th-anniversary celebration of the Graduate Aerospace Laboratories at Caltech (GALCIT). Chamitoff returned to campus on October 26, 2009, to give the annual Klein Lecture in Aerospace Engineering. Afterward, he presented GALCIT with a banner emblazoned with a caricature of GALCIT founding director Theodore von Kármán that Chamitoff had taken with him to the space station.

THE SOLAR ARMY IS RECRUITING

In the battle to save the world from global warming, the newest weapons are LEGO Mindstorms robotics kits, inexpensive lasers, and ink-jet printers that spit out metal salts instead of ink. The newest recruits are high school students, guided by generals from Caltech's chemistry department. The objective is to locate a metal oxide that can use sunlight to split water into hydrogen, a storable fuel, and thus wean us from fossil fuels.

The project is the brainchild of Bruce Parkinson (PhD '78), now a chemistry professor at the University of Wyoming, who got the idea while watching his own high-school-age children playing with LEGOs. Parkinson combined LEGOs with a laser pointer and other cheap, readily available components to create a $600 computer-controlled, gear-driven testing device that very precisely scans a laser beam across three-millimeter-diameter metal-oxide samples printed on CD-sized glass slides. As

From left: Postdoc Bryce Sadtler, grad student James McKone, and grad student Jillian Dempsey give a lunchtime presentation at John Muir High School in Pasadena.



Carolyn Valdez (right) explains the setup to Chelsea Newbold (left), an 11th-grader at Blair High School. The slide to be scanned goes in the frosted-glass tank at the right. The laser beam is marched across the slide by a pair of angled mirrors (follow Carolyn's fingers) facing each other and mounted on two perpendicular assemblies of gears and connecting rods driven by the Mindstorm motor units (the gray cylinders, one of which is obscured in this view); the laser pointer itself rests behind the one red LEGO brick in the cradle at the left of the apparatus.

the metal oxide pixels get illuminated one by one, the electrical current generated by this artificial sunlight is measured for each one.

Parkinson and Caltech's Powering the Planet Center for Chemical Innovation have parlayed this gizmo into a project called SHArK, for Solar Hydrogen Activity Research Kit. (The small "r" allows the acronym to be written as a sequence of chemical elements.) Initially funded with seed money from the Dreyfus Foundation and now supported by the National Science Foundation, SHArK has the potential to rally young people around the globe to collaborate on solving a real-life problem.

"We've been flooded with requests from students and parents who want to join the Solar Army," says Harry Gray, the Beckman Professor of Chemistry and a member of the center. "There are millions of possible metal oxide combinations that might work. We need thousands of students to check them out. We don't have a really good idea which combinations will be the winners."

The winners will be dirt-cheap, nontoxic, readily available compounds that can mimic photosynthesis and split water into hydrogen (to run a fuel cell to produce electricity; unlike sunlight, hydrogen can be stored for use at night) and oxygen. Plants photosynthesize with organic molecules that they replace every 30 minutes or so because oxidation is a brutal process that degrades living tissue. But an inorganic, metal-oxide catalyst would be able to withstand oxidation, because it's already oxidized.

Finding that catalyst is a little like locating a rusty needle in the periodic haystack of elements. The best candidate will probably consist of an oxide containing three or four metals working together in order to absorb as broad a spectrum of sunlight as possible. That's the easy part. The hard part is that the metal-oxide combo must then spit out electrons that are energetic enough to split water.

Grad students Jillian Dempsey, Suzanne Golisz, James McKone, and Leslie O'Leary, undergrad Carolyn Valdez (BS '10), and postdoc Bryce Sadtler are mentoring student volunteers at three local high schools—Blair High School, John Muir High School, and Polytechnic School. Each student group is given their own kit to assemble, and is shown how to print their own slides and how to use the scanner.

The project was born in 2004 when Parkinson, then at Colorado State, started work on a method to retrofit ink-jet printers to handle metal nitrate salt solutions rather than ink. Heating the slides to 500°C then transforms the salts into metal oxides. Nate Lewis (BS '77, MS '77), Caltech's Argyros Professor and professor of chemistry, who had overlapped with Parkinson at Caltech while a student, heard about the work at a meeting and dispatched grad student Jordan Katz (PhD '08) and undergrad Todd Gingrich (BS '08) to visit Parkinson's lab. The Lewis lab then adapted the idea, improving the design so that it yielded more data per sample.

Each slide contains 16,200 unique metal oxide samples grouped in four adjoining triangles. Each triangle contains oxides of three different metals in a gradual continuum of concentrations, ranging from equal amounts of all three metals at the triangle's center

"There are millions of possible metal oxide combinations that might work. We need thousands of students to check them out."

point to 100 percent of one metal at each tip of the triangle. Each slide also has two smaller triangular arrays of metal oxides with known photoelectric behavior, used for calibrating the measurements.

In a process that takes some six to eight hours per slide, a pulsed green laser slowly scans each pixel while the slide is suspended in an electrically conductive solution of sodium hydroxide. If a metal oxide splits water, current will flow through the solution to an electrode, registering a "hit." Teams share their information on the infobahn, and if the hit is validated by another high school or college, the formulation will be further tested at Wyoming or Caltech. Eventually, of course, we'll have to figure out how to produce enough of the winning stuff to support the power grid.

The project continues to expand, and Parkinson and Gray plan to extend their recruiting activities to more colleges and high schools. (See www.thesharkproject.org for more information.) "These are the kids who are going to make the difference as to whether we're going to have solar energy," says Gray. "This is the future of the planet. And, by the way, it's your future." *—LD* E&S

INTRABODIES R US

About 30,000 Americans suffer from Huntington's disease, a gradual loss of brain cells that affects the ability to speak, move, and even think. There is no cure as yet, but now a way to slow the disease's progress may have been found by Caltech scientists.

Huntington's has its roots in a mutation in the gene for a protein called huntingtin. Huntingtin is essential for normal brain development, although its exact function is unclear. The mutation creates an abnormally long version of the protein, which normally contains a string of 10 to 35 copies of an amino acid called glutamine. The mutation has a genetic stutter, causing this string to lengthen to as many as 120 glutamines. The abnormally long protein gets chopped up into smaller pieces that accumulate in a part of the brain called the basal ganglia, eventually killing the cells. As the cells die, decision-making skills and memories fade, coordination decreases, and twitches set in in the fingers, feet, and face.

Back in 2002, Senior Research Fellow in Biology Ali Khoshnan, biology staff member Jan Ko, and Paul Patterson, the Biaggini Professor of Biological Sciences, discovered that certain molecules could bind to the mutant protein and either block or exacerbate the mutant's toxicity. These molecules belong to a class of molecules now known as "intrabodies," or intracellular antibodies, because they work like antibodies but operate inside a cell rather than binding to a target protein on the cell surface. The intrabody gets into the cell by hitching a ride on a tame virus, which then hijacks the cell's machinery to flood the cell with it.

Now, grad student Amber Southwell (PhD '09), Ko, and Patterson have shown that an intrabody called Happ1 can reverse much of the loss of coordination and cognition in five different strains of mice bred to mimic various aspects of Huntington's disease—the first time this has been demonstrated so effectively in mammals. (Previous studies had used cell cultures or fruit flies.) In one strain, Happ1 actually increased the mouse's body weight and life span.

Happ1 binds to an amino-acid sequence unique to the huntingtin protein that is rich in the amino acid proline, and this sequence is expected to be extremely specific. "Our studies show that the use of intrabodies can block the parts of mutant huntingtin that cause its toxicity without affecting

PICTURE CREDITS
2–4 — Mike Rogers; 5 — NASA/JPL-Caltech/UCLA 7 — NASA; 7 — Linda Doran; 8 — Jillian Dempsey; 10, 11 — Eugeniu Plamadeala

The "SOLD" banner comes down from the facade of MIT's Building 10. Had things gone according to plan, the banner would have been visible from the Charles River.

the wild type, or normal, huntingtin—or any other proteins," says Patterson.

In other words, he says, this has the potential to be the kind of "silver-bullet therapy" that many medical researchers look for. Current treatments tend to address the disease's symptoms, not its cause, but this approach might prevent it from doing significant damage in the first place.

The next step, says Patterson, is to improve the intrabody's effectiveness and to "build a viral vector that can be controlled—induced and turned off—in case of unexpected side effects. This is a general goal shared by all types of experimental gene therapies."

A paper describing the work, with Southwell as the lead author, was published in the October 28 issue of the *Journal of Neuroscience*. The research was funded by the Hereditary Disease Foundation, the CHDI Foundation, and the National Institute of Neurological Disorders and Stroke. —*LO* e&s

SO CAL'S SEISMO STIMULUS

A major upgrade is under way at the Southern California Seismic Network, jointly operated by Caltech and the U.S. Geological Survey. The $3.2 million project is part of an overhaul of all of the USGS's networks that is being funded by federal stimulus money for infrastructure improvements.

Locally, this means new equipment at 138 out of some 300 monitoring stations, and minor upgrades at 40. The original units were deployed in the 1990s as part of the TERRAscope and TriNet projects. The off-the-shelf digitizers available nowadays are much more compact and draw less than a watt of power, says David Johnson, Caltech's lead field installer, "which is really significant when we go solar at our sites."

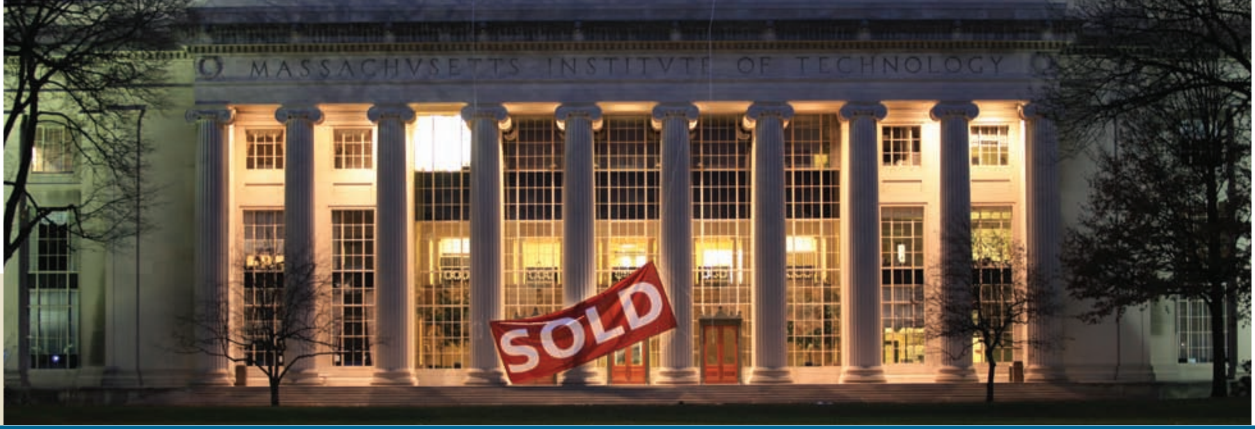
Besides making fundamental improvements to the network's data quality and reliability, "the new equipment will log data fast enough to allow us to develop algorithms for an early warning system," says Senior Research Associate in Geophysics Egill Hauksson, who is in charge of Caltech's end of the project. However, he notes, an actual warning system would require many additional stations and remains years away.

The current project, which started last October, will be finished in September 2011. —*DS* e&s

SOLD!

"Bowing to extreme financial pressures, MIT administration today made official the sale of the Institute to Caltech. The campus is to be repurposed as Caltech East, a new School of the Humanities, serving as a complementary counterpart to Caltech's scientific excellence," read the top story of the Monday, November 30, 2009, issue of *The Tech*, the MIT student newspaper. The changeover would include reassigning all MIT undergrads to new majors in the new school, the paper went on to say. "While East Campus students will still be held to the same high academic standards to which they are accustomed, they will be relieved of the responsibility of advancing human knowledge through scientific research." As part of the formalities, a giant SOLD banner would be hung in Killian Court to greet students returning from their Thanksgiving break.

Ah, but it was just a Caltech prank.



Following six months of intense planning and reconnaissance, zero hour was 0330 on the 30th. ASCIT president Anthony Chong, a senior, led the operation, ably supported by 18 undergrads and 25 or so alumni who hosted students and picked up and delivered the banners, fliers, T-shirts, and fake newspapers. “Michael Betancourt (BS ’06), Kasia Gora (BS ’06), and Russell McClellan (BS ’09) really stepped up,” Chong says. The strike team was divided into three groups.

The roof team unfurled the banners. Besides the SOLD sign, other banners were to be hung along Massachusetts Avenue, MIT’s main drag, proclaiming, “Welcome to Caltech East, School of the Humanities.”

The corridor team deployed new floor mats featuring the Caltech East seal, an amalgam of the Caltech and MIT logos, and changed the administrators’ office-door nameplates. Fliers to be distributed along the way teased readers with announcements of tutorials on such topics as “How to sustain yourself as a freelance writer,” and an invitation to join the new Caltech East Surf Club.

Meanwhile, the tech team finished up the Caltech East website, http://east.caltech.edu, which included a pdf of the eight-page bogus *Tech*. (Visit http://east.caltech.edu/tech.pdf to read it.) The lead story’s companion photo showed Caltech president Jean-Lou Chameau shaking hands with MIT’s Susan Hockfield, “sealing the deal.” Other articles included the announcement of a new Caltech East mascot (another beaver) and various orientation materials, including a Caltech glossary and the following handy conversion chart to help befuddled East Techers find their new majors:

▪ BIOLOGY: Biology
(Keep it. This science is so soft it might as well be a humanities option.)

▪ CHEMISTRY: Foreign Language
(Considering IUPAC nomenclature, I’d say you’re already halfway there.)

▪ ENGINEERING: Economics
(Hey, they both start with “E” and you still get to do useful math.)

▪ MATHEMATICS: Philosophy
(At least you’re still in a field not applicable to the real world.)

▪ PHYSICS: Women’s Studies
(It’s time you guys learned some manners. And how to bathe.)

Alas, despite much practice on Caltech buildings, the SOLD banner did not drop as quickly as anticipated. Other team members were recruited to help, which slowed down the entire enterprise. But ultimately, it was an MIT janitor who doomed the deed. After spotting the new floor mats, and over Chong’s protests, the janitor called the MIT police, who have no sense of humor. The pranksters were stopped dead in their tracks and forced to take down all their work. Some of the faux *Tech*s were distributed anyway by alumni unaware that the plot had been foiled, causing—one hopes!—a few confused MIT students.

Despite being busted in flagrante, “All in all, I’m pretty happy,” Chong says. “We were sooooooo close. Another 10 minutes and everything would have been done.”

Oh, well—better luck next time. Thanks to Assistant Vice President for Student Affairs and Campus Life Tom Mannion and some generous alumni, there’s now a prank club and some non-Institute funding for future adventures. —*DP* E&S

Left: The prank team. Top row, left to right: Anthony Chong (’10), Sebastian Rojas Mata (’13), Isaac Sheff (’12), John Forbes (’10), Heather Widgren (’10), Raymond Jimenez (’13), Alex Rasmussen (’12). Bottom row: Jordan Theriot (’12), Eugeniu Plamadeala (’10), Ryan Thorngren (’13). Missing: Peggy Allen (’11), Perrin Considine (’12), Megan Larisch (’12), Rebecca Lawler (’13), Julian Panetta (’10), Nicholas Rosa (’10), Stefan Skoog, Will Steinhardt (’11). Right: The new Caltech East seal.